

REMARKS

This amendment responds to the Office Action mailed . In the Office Action the Examiner:

- rejected claims 1-23 under 35 U.S.C. 102(e) as being anticipated by Lupash; and
- rejected claims 1-23 under 35 U.S.C. 102(b) as being anticipated by Yu (5,841,399) or Schipper et al. (6,114,988).

After entry of this amendment, the pending claims are: claims 1-50.

In Paragraph 1 of the Office Action, the Examiner has requested copies of references cited in PTO-1449. Copies of these references have been submitted herewith.

Applicants have amended claims 6, 8, 13 and 22 to ensure proper antecedent basis and to remove typographical errors.

In paragraph 3 of the Office Action, the Examiner has rejected claims 1-23 under 35 U.S.C. §102(e) as being anticipated by Lupash. Additionally, in paragraph 4 of the Office Action, the Examiner rejected claims 1-23 under 35 U.S.C. §102(b) as being anticipated by Yu or Schipper. Applicants traverse these rejections.

Amended claim 1 now recites:

1. (Currently amended) A method for identifying a faulty measurement among a plurality of measurements that are used to determine a state of a discrete-time controlled process, comprising:
 - computing a plurality of correlation values, each correlation value associated with one of the plurality of measurements; and
 - selecting a measurement among the plurality of measurements as the faulty measurement based on the correlation values.

Lupash discloses a multi-stage process for detecting and excluding faulty measurements in a satellite positioning system receiver. (Abstract). More particularly, Lupash generates a fault exclusion list of test statistics for a set of measurements, where each test statistic is calculated with a different measurement omitted from the calculation. Col. 8, line 56 through col. 10, line 31. (Emphasis added.) Each test statistic in the fault exclusion list is compared against a normalized false detection threshold T_D . If the test statistic is less

than the false detection threshold T_D (i.e., a fault is no longer detected with a given measurement omitted), it is concluded that the omitted measurement is the faulty measurement. Col. 9, lines 38-40. A test statistic is defined by Lupash at column 8, lines 56-65, as the magnitude of a normalized fault vector, which is given by the equation

$$f = W \cdot [I - (H^T W^T W H)^{-1} H^T W^T W] \cdot y. \quad (1)$$

It should be clear from Equation (1), that the vector f is a function of the vector y , and the vector y is defined by Lupash as a $n \times 1$ vector containing “changes in the measurements.” Col. 8, lines 63-64.

The Examiner cited Figures 2-6, 8A and 8B as disclosing the claimed subject matter. Applicants disagree.

Figures 2-6 and 8A are processes for detecting the existence of a fault and the availability of fault exclusion, but none of these figures address “identifying a faulty measurement among a plurality of measurements,” as recited in claim 1.

Figure 8B addresses isolating a faulty measurement but fails to disclose or suggest “computing a plurality of correlation values, each correlation value associated with one of the plurality of measurements” or “selecting a measurement among the plurality of measurements as the faulty measurement based on the correlation values,” as claimed.

Applicants could not find anywhere in Lupash where the term “correlation” or “correlation values” is used with respect to identifying faulty measurements. To the extent the Examiner contends that the “test statistics” disclosed by Lupash read on the claimed “correlation values,” Applicants submit that the test statistics disclosed by Lupash are each associated with multiple measurements and not “one of the plurality of measurements,” as claimed. Col. 8, line 56 through col. 10, line 31. Furthermore, there are many types of statistics other than correlations. There is no teaching in Lupash (1) that the test statistics in Lupash are correlations, as generally defined, nor (2) that the test statistics in Lupash are the specific type of correlations required by the pending claims.

Yu discloses a fault detection system for a global positioning system (GPS) receiver that is similar to the system disclosed by Lupash. More particularly, Yu discloses computing

test statistics for all of the possible subsets of satellites, removing one satellite at a time. Col. 1, lines 15-24. (Emphasis added.) The test statistics are ranked in decreasing order in a list. *Id.* The subsets with the lowest test statistics below a statistic threshold are used to exclude a faulty satellite. *Id.*

Similar to Lupash, Yu fails to disclose or suggest “computing a plurality of correlation values, each correlation value associated with one of the plurality of measurements” or “selecting a measurement among the plurality of measurements as the faulty measurement based on the correlation values,” as claimed.

Schipper discloses a GPS receiver fault detection method for use in a GPS attitude determination system having multiple receivers. (Abstract). More particularly, a root means square (RMS) value of the individual measurement residuals for the satellite vehicles and antenna pairs for computing a particular attitude solution is computed and used for comparison to determine a faulty receiver. Col. 12, lines 10-20. (Emphasis added.)

The Examiner cites Figure 2, step 54 and Figure 3, step 56 as showing the claimed elements. Applicants disagree.

In step 54, post-update measurement residuals for each attitude solution are computed. In step 56, receiver failures are determined from the measurement residuals. Applicants fail to understand how these steps show or suggest “computing a plurality of correlation values, each correlation value associated with one of the plurality of measurements” or “selecting a measurement among the plurality of measurements as the faulty measurement based on the correlation values,” as claimed. Applicants’ claim 1 is directed to a method for identifying a faulty measurement among a plurality of faulty measurements and not to a method of identifying a faulty receiver among a plurality of GPS receivers, as is disclosed by Schipper.

The failure of the cited references to show or suggest each and every element of claim 1 vitiates any basis for rejection of claim 1 under 35 U.S.C. §§ 102(b) or 102(e). Applicants respectfully request that the Examiner withdraw the rejections of claim 1 and allow claim 1, as amended.

Claims 2-13 depend from claim 1 and include all the limitations of claim 1. The Examiner has failed to provide any grounds for his rejections of claims 2-13 in the Office Action. For example, the Examiner has failed to show where any of the cited references disclose or suggest “computing a residual sensitivity matrix” (claim 3), “identifying a second highest correlation value”) (claim 8), “determining a size of an error in the faulty measurement” (claim 11), etc.

“Where a claim is refused for any reason relating to the merits thereof it should be ‘rejected’ and the ground of rejection fully and clearly stated.” MPEP 707.07(d). (Emphasis added.)

Notwithstanding the Examiner’s failure to provide a basis for his rejections, Applicants submit that claims 2-13 are allowable for at least the same reasons as claim 1 and for the independent subject matter contained therein. Applicants respectfully request that the Examiner withdraw the rejections of claims 2-13 and allow claims 2-13, as amended.

Amended claim 14 now recites:

14. (Currently amended) A method for detecting and identifying a faulty measurement among a plurality of GPS measurements obtained by a GPS receiver with respect to a plurality of satellites, comprising:
determining whether the plurality of GPS measurements include a faulty measurement; and
in response to a determination that the plurality of GPS measurements include a faulty measurement, identifying a satellite contributing the faulty measurement by:
computing a plurality of correlation values, each correlation value associated with one of the plurality of measurements; and
selecting a satellite among the plurality of satellites as the satellite contributing the faulty measurement based on the correlation values.

Claim 14 includes the limitations “computing a plurality of correlation values, each correlation value associated with one of the plurality of measurements”, and “selecting a satellite among the plurality of satellites as the satellite contributing the faulty measurement based on the correlation values.” These limitations have been previously argued with respect to claim 1, and those arguments are equally applicable to claim 14.

Independent claim 22 recites:

22. (Currently amended) A computer readable medium comprising computer executable program instructions that when executed by a processor in a digital processing system, causes the digital processing system to perform the operations of:

 computing a plurality of correlation values, each correlation value associated with one of the plurality of measurements; and
 selecting the measurement associated with a highest correlation value among the plurality of correlation values as the faulty measurement.

Claim 22 includes the limitation of “computing a plurality of correlation values, each correlation value associated with one of the plurality of measurements” and “selecting the measurement associated with a highest correlation value among the plurality of correlation values as the faulty measurement.” As previously argued, none of the cited references show or suggest these limitations.

The failure of the cited references to show or suggest each and every element of claims 14 and 22 vitiates any basis for rejections of claim 14 and 22 under 35 U.S.C. §§102(b) and 102(e). Applicants respectfully request withdraw of the rejections of claims 14 and 22 and allowance of claims 14 and 22, as amended.

Claims 15-21 and 23 depend from claims 14 and 22, respectively, and include all the limitations of claims 14 and 22. Again, the Examiner has failed to provide any grounds for his rejections of claims 15-21 and 23 in the Office Action. Notwithstanding the Examiner’s omission, Applicants submit that claims 15-21 and 23 are allowable for at least the same reasons as claims 14 and 22, and for the independent subject matter contained therein. Applicants respectfully request withdraw of the rejections of claims 15- 21 and 23 and allowance of claims 15-21 and 23.

Applicants have added new claims 24-50. Support for these claims can be found in the specification as filed.

Claims 24-36 include the limitations of claim 1 that are distinctive over the cited references, but are directed to a computer-readable medium. Therefore, claims 24-36 are allowable for at least the same reasons as claim 1 and for the independent subject matter contained therein.

Claims 37-49 include the limitations of claim 1 that are distinctive over the cited references, but are directed to a system. Therefore, claims 37-49 are allowable for at least the same reasons as claim 1 and for the independent subject matter contained therein.

Claim 50 includes the limitations of claim 1 that are distinctive over the cited references, but is in means-plus-function format. Therefore, claim 50 is allowable for at least the same reasons as claim 1 and for the independent subject matter contained therein.

In light of the above amendments and remarks, the Applicant respectfully requests that the Examiner reconsider this application with a view towards allowance. The Examiner is invited to call the undersigned attorney at (650) 849-7630, if a telephone call could help resolve any remaining items.

Respectfully submitted,

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